NOAA's National Climatic Data Center
User Engagement Fact Sheet
Sector: ENERGY

OVERVIEW

The energy sector is comprised of a wide range of businesses involved in the exploration, extraction, production, refining, distribution, and sale of energy. The primary industries within this sector include petroleum, gas, electric, coal, and nuclear energy, along with renewable energies such as solar, wind, hydropower, and biomass. Climate change and expected changes in the frequency of extreme weather events pose a major challenge to the energy industry. Warming temperatures directly affect heating and cooling requirements and also lead to rising sea level, altered precipitation patterns, reduced snowpack and earlier melt, and other climate change impacts that in turn can affect energy supply and demand, the distribution of fuel sources, and the future locations of power plants. This sector is unique in that not only are its business practices affected by climate change, but energy production and use also play a dominant role in warming of the atmosphere and oceans. Climate can affect environmental trends, with effects on business plans, regulatory requirements, and operations. Having access to relevant and easily understandable weather and climate data is essential for strategic planning purposes, risk management, and for assessing environmental footprints.

KEY STAKEHOLDERS

NOAA's National Climatic Data Center (NCDC) works with various groups, both as an information provider and as an applied research partner, to examine the effects of weather and climate on energy. This type of information can help engineers and decision makers within the energy sector make practical choices in order to adapt to climate changes and variations and to mitigate possible impacts. There are many different government and non-governmental organizations, and public and private groups and businesses that can benefit from using relevant climate and weather-related information. Some major groups include:

- Energy corporations and utility companies
- Energy regulators
- Professional societies and trade associations
- The U.S. Department of Energy
- The U.S. Environmental Protection Agency
- The Electric Power Research Institute
- Academia and other researchers

SECTOR NEEDS

Climate information is often available only as raw observations or in the form of tables, graphs, or written summaries, which may be difficult for users who are not well-versed in climate science to fully interpret. To bridge this gap, NCDC is partnering with the energy sector to translate climate data into accessible, useful, and accurate products; and to leverage NCDC's climate expertise to better understand what the information means and how it can be used most effectively.

Climate information can be used in a variety of ways. Some examples include:

- Using global surface hourly data for studies of wind energy potential to drive wind turbines for electricity generation.
- Using solar radiation data to estimate solar energy potential.
- Using temperature information to aid in the assessment of equipment requirements for heavy power line loads during extremely hot weather.

- Using hourly temperature, relative humidity (and/or dew point), cloud cover, precipitation, and wind speed and direction data in electric load forecasting models and scenario analyses, for use by utility and power trading companies.
- Using heating/cooling degree day data—measures of expected energy usage for heating and cooling, based on cumulative daily average temperature observations below (heating degree days) or above (cooling degree days) a specific threshold, typically 65°F—to help energy regulators determine what rates electric utilities can charge their customers.

NCDC DATA AND PRODUCTS

There are many different types of useful climate information available. Some examples include:

- *Climate Normals*, which are the average values of meteorological elements, such as temperature, precipitation, frost/freeze data, and snowfall data, over 30 years. The normal climate helps describe the climate and is used as a base to which current conditions can be compared.
- The *Residential Energy Demand Temperature Index* (REDTI), which is based on population-weighted heating and cooling degree days.
- The *Severe Weather Data Inventory* (SWDI), which includes information critical to the detection and evaluation of severe weather derived from radar, such as features related to general storm structure, hail, and tornadoes, preliminary and verified reports of storm damage, and National Weather Service warnings.
- The *Integrated Surface Data* database, which contains climate information such as wind speed and direction for about 10,000 stations, with some dating as far back as 1901.
- The *National Solar Radiation Database*, which contains hourly solar radiation and meteorological data for more than 1400 stations.

Collaboration between climate scientists and the energy community is essential in helping to build the necessary bridges that will transform climate data into information that is relevant and credible. Having NOAA membership on selected committees has proven to be an excellent way to improve communication and information use. Ongoing communication is important to ensure that the information NCDC provides is appropriate and applicable to energy sector needs. As climate changes in the years ahead and the effects become more noticeable, new information needs will emerge. NCDC will work closely with this sector, attending trade meetings and sponsoring future workshops and conferences, in order to better understand, address, and anticipate these needs.

Additional details about available NOAA products and the economic benefits of these products are provided at:
http://www.economics.noaa.gov
For further information on obtaining climate services and products related to energy from NCDC please contact:

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NOAA Satellite and Information Service
National Environmental Satellite, Data, and Information Service (NESDIS)

National Climatic Data Center (NCDC)
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